DOCUMENT RESUME

ED 393 135 CS 509 218

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TITLE Helpful Hints toward Critical and Creative Thinking in the Classroom.
PUB DATE Nov 95
NOTE 48p.; Paper presented at the Annual Meeting of the Speech Communication Association (81st, San Antonio, TX, November 18-21, 1995).
PUB TYPE Speeches/Conference Papers (150) -- Guides - Classroom Use - Teaching Guides (For Teacher) (052) -- Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Class Activities; *Critical Thinking; Elementary Secondary Education; Higher Education; *Speech Communication; Student Development; *Thinking Skills
IDENTIFIERS *Thinking across the Curriculum

ABSTRACT

Suggesting that critical thinking activities are the crux of many of the goals and objectives of communication education, this paper summarizes a sample of the literature on critical thinking. Based on the review, the paper notes that: (1) a consensus exists regarding what critical thinking is and what specific skills are acquired through varied activities and are applied differently by students in specific situations; and (2) educators recognize that there are multiple ways of helping students learn to think in a critical manner in their classes. The paper also takes a more practical approach to the discussion of critical thinking for the K-12 teacher by appending 14 sample exercises or class activities taken from instructor's manuals used in many beginning communication courses at colleges and universities. Contains 58 references. Additional appendixes provide a 111-item list of additional readings in critical thinking and 6 brief hints on using or modifying exercises for critical thinking. (Author/RS)

HELPFUL HINTS TOWARD CRITICAL AND CREATIVE THINKING IN THE CLASSROOM

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ABSTRACT

We start by summarizing a sample of the literature on critical thinking. Educators and administrators emphasize the development of critical thinking skills in all students -- taught in the early grades and reinforces throughout the rest of a student's education. We did not feel the compulsion to argue that teaching critical thinking is important. Every report and article we examined concluded teaching students to think critically has long-lasting benefits. However, as we read the literature on critical thinking, we found that, initially, there was confusion regarding a definition or description of critical thinking. This is true even though in ancient Greece, one of the goals of education was to help students become more effective thinkers.

Mortimer Adler points out: "The misconception that underlies the now widely prevalent educational vogue is that thinking is a skill that can be acquired in isolation from all other skills that enable us to use our minds effectively, in the performance of which we are involved in judging, reasoning, problem-solving, arguing, and defending or rejecting conclusions." We feel safe in asserting that these activities are the crux of many of the goals and objectives of communication education.

Currently, there seems to be consensus regarding a what critical thinking is and that specific skills are acquired through varied activities and are applied differently by each students in specific situations. And educators and educational psychologists recognize that there are multiple ways of helping students learn to think in a critical manner in their classes. This realization is true regardless of subject matter taught -- communication, English, sociology, geography, biology, math, chemistry, etc. Adler concludes: "There can be no question whatsoever that developing in the minds of our students the ability to think -- critically at least, if not also creatively -- should be the prime objective of basic schooling." The general conclusion is that critical thinking education involves pedagogical strategies, textbooks, handouts, classroom exercises, course assignments, and challenges that make students think.

After summarizing the literature, we take a more practical approach to the discussion of critical thinking for the K-12 teacher. We include, for the reader, samples of exercises or class activities from instructor's manuals used in many beginning communication courses at colleges and universities across the country. The purpose for including them is to illustrate that there are communication-related activities and class exercises available for the K-12 instructor to use in their classes to teach critical thinking in our discipline's approaches to pedagogy.

Finally, we provide a list of additional readings that can be located by the reader to supplement their interest in critical thinking application. These readings provide a valuable resource of information for personal use or to share with your colleagues at your own schools.

HELPFUL HINTS TOWARD CRITICAL AND CREATIVE THINKING IN THE CLASSROOM

"There's one thing worse than making mistakes in your thinking; that's letting somebody else make them for you."

- *Anthony Bard*

"What we need is not the will to believe, but the will to find out."

- *Bertrand Russell*

"Give me a fish and I'll eat today. Teach me to fish and I'll eat for a lifetime."

- *Chinese Proverb*

Nothing is more important, in our opinion, than for communication educators to help students to think critically about their world. Nelson writes, "We must adapt to the general lack of critical thinking skills in the student population" (1989, p. 1). This adaptation demands us to teach critical thinking skill development in our classes. Students have to become more critically aware of the world around them, to think critically of events and circumstances, and to respond critically to their perceptions.

Piaget (1948) challenges educators to re-evaluate their goals for students from conformity and obedience to critical thinking and choice making. He suggests the need for student autonomy and the development of self-directedness through the enhancement of information processing and evaluation skills. There has emerged from the literature on critical thinking an extensive number of "reasons" for rethinking the value of teaching, or encouraging the development of, critical thinking.

Brookfield (1987) outlines several important justifications for integrating development of critical thinking into teaching practice. He reminds us that, aside from teaching "skills of logical analysis", we ask students to "call into question the assumption underlying our customary, habitual ways of thinking and acting," and in the process challenge students to be "ready to think differently on the basis of critical questioning" (p.1). He lists three important and positive outcomes that may follow, including:

(1) a healthier democracy where people are prepared to question policies and politicians

(2) more efficient workplaces where organizers are able to evaluate and reorganize as needed

(3) stronger relationships between persons who are able to thoughtfully evaluate and adjust behavior.

Pioneers in the study of critical thinking have forwarded many justifications for teaching strategies that enhance the critical thinking atmosphere of the classroom. Education researchers have found that increased ability to critically evaluate information leads to development of tolerance for unique persons or personalities (Mead, Metraux, 1952) and new ideas (Barron, 1958). In these times of increasing emphasis on cultural diversity and being sensitive to differing points of view, helping students develop skills in rhetorical sensitivity. through critical thinking is an important goal for our educational system.

Artistic talents are encouraged (Torrance, 1958), as are contributions to the development of the culture (Russell, 1956) through an educational focus on creative thinking. Creative cognitions are enhanced (Bartlett, 1953), and ventures into the unexplored are inspired (Ferren, 1953). Critical thinking, according to Torrance, is responsible for "scientific theories, inventions, improved products, novels, poems, designs, [and] paintings" (1962, p. 32). As students pass through the phases of critical thinking, as described by Brookfield (1987), they are better able to think creatively and to view issues and values from differing points of view. These phases are (Brookfield, 1987):

(1) *Trigger Event:* "Some unexpected happening prompts a sense of inner discomfort and perplexity" (p. 26).

(2) *Appraisal:* "A period of self-scrutiny and appraisal of the situation follows the trigger event" (p. 25).

(3) *Exploration:* "Having admitted to anomalies or discrepancies in some aspect of life, we begin to search for new ways of explaining these discrepancies or of living with them -- ways that reduce our discomfort" (p. 25).

(4) *Developing Alternative Perspectives:* "Arising out of the testing and exploring of alternatives comes ways of thinking and acting that we feel 'make sense' for our situations" (pp. 25-26).

(5) *Integration:* "Having decided on the worth, accuracy, and validity of new ways of thinking or living, we begin to find ways to integrate these into the fabric of our lives" (p. 27).

The challenge to the teacher hoping to increase a student's capacity to think critically is, to teach these phases and illustrate their importance to the student. Teachers need exercises and class activities to help students practice the essential elements of these phases -- each contributing to the overall development of critical thinking skills.

Habermas labeled critical thinking "emancipatory learning."

The learners who think critically are cogent of the circumstances and events that have made them what they are, and are prepared to find ways to modify (1979). Apps claims that emancipatory learning "frees people from personal, institutional, [and] environmental forces" and helps them "gain control over their personal lives" (1985, p. 151).

Critically determining the irrationality of a situation or of a claim is the activity of differentiating evidence from opinion (O'Neill, 1985). There are twelve aspects, according to Ennis (1962), of critical thinking, including recognition of contradiction and identifying the logic of conclusions. Apps (1985) equates critical thinking with dialectical thinking which is the consideration and solving of contractions. Olson and Babu write,

> A theory of thinking may be concerned with thought and how it comes to have expression in action or utterance. Critical thinking, on the other hand, is concerned with analysis of these products; it is a piece with criticism -- literary criticism, film criticism, architectural criticism, or what have you. That would give the enterprise a distinctiv content. (1992, p. 184)

In "criticizing" these comments, then, educators need to be concerned with processes of criticism that contribute to the development of critical thinking in our students. Teaching

criticism offers communication educators opportunity to reinforce different ways of viewing issues and points of view. Providing students with the skills requisite to be a critic has long-term benefit -- regardless of how students ultimately apply them. As noted above, these standards can be applied in literature, film, and even architecture and more.

In an essay by Boyd and Fales (1983), critical thinking is compared to the reflective learning technique of assessing an issue to determine the need for a new approach. Halpern (1984) views critical thinking as the ability to use logical thought for the planning and implementing of strategies to achieve goals. Concerning the fundamentals of critical thinking, Ruggiero states, "It is the process of finding answers when they are not so readily available" and "support[ing] beliefs with reasons" (1995, pp. 17,18). Smith observes that critical thinking involves the capability to discern "observations from inferences" (1953, p. 130), ard Ennis notes that critical thinking encompasses "problem-solving, decision-making, metacognitions, rationality, rational thinking, reasoning, knowledge, and intelligence" (1987, p. 12). Paul (1981) discusses the concept as the person's ability, via critical thinking, to become cognizant of ego-centric and ethnocentric thinking, and Siegel (1988) also addresses the notion of increased abilities to use logic and reason in recognizing elements of argument: warrant, data and claim. Being aware of ethnocentricism in our culture is very important -- Americans are one of the most ethnocentric

populations on the planet. If we can help students move away from a death-grip on ethnocentrism and gain increasing understanding of other ways of thinking and of doing things, then the teaching of critical thinking has been successful.

McGuinness discusses three conceptions of thinking including "thinking as making judgment" and equates this with critical thinking and "sense-making" (1993, p. 305). Brookfield contends,

> Given that critical thinking is often thought of as an abstract academic activity that has little to do with the reality of adult life, it is important that this idea be dispelled by making clear the two activities central to critical thinking . . . -- (1) identifying and challenging assumptions and (2) exploring and imagining alternatives -- are directly Observable on many occasions in adults' lives. (1987, p. 15)

These ideas are consistent with ideas previously presented regarding the goals, objectives, elements, and activities of developing skills in thinking critically.

This ideas is reinforced by other scholars in discussing critical thinking. According to Dalaz (1986), critical thinking accepts that truth is not absolute but relative. It is toward this kind of open-mindedness that Drake (1976) points when he challenges instructors to incorporate critical thinking

activities in the classroom. Many researchers have evaluated the educational systems and found them deficient in programs that enhance critical thinking skills (Young, 1980; Meyers, 1986; Stice, 1987; Kitchener, 1986; King, Kitchener, & Wood, 1985; Perry, 1970; Ruggiero, 1995). McPeck stresses the need for developing teaching tactics that "ward off sophistry" (1981, p. 92). Scholars recognize the importance of the role of the teacher in establishing learning environments conducive to critical thinking (Missouri LINC Module, 1985; Smith, 1981; Sinclair, 1994; Riding, & Powell, 1993).

Tripp observes, "We are exhorted to teach our students to think critically so that they can communicate clearly and effectively both orally and in writing. . . . We must teach the originating skills . . . and the receiving skills; both sets require analytic abilities" (1990, p. 183). Communication educators, regardless of the grade level being taught, can either accept the challenge of developing critical thinking skills to help students communicate better; or we can choose to ignore this challenge. The development of communication skills has, it seems to us, gone hand-in-hand with helpings students think. In our classes, we ask students to think about what to say, how to say it, how to respond to message, and how to integrate listener feedback into subsequent communication. ***Communication educators are in an enviable position as instruction in critical thinking continues to receive tremendous national, state, and community recognition.*** If we examine the ramifications of accepting or

rejecting this challenge, let's examine one set of differences posited about critical thinkers and uncritical thinkers.

TABLE 1

Critical Versus Uncritical Thinkers

Here are some additional characteristics of critical thinkers, as contrasted with those of uncritical thinkers.

Critical Thinkers	*Uncritical Thinkers*
Are honest with themselves, acknowledging what they don't know, recognizing their limitations, and being watchful of their own errors.	Pretend they know more than they do, ignore their limitations, and assume their views are error-free
Regard problems and controversial issues as exciting challenges.	Regard problems and controversial issues as nuisances or threats to their ego.
Strive for understanding, keep curiosity alive, remain patient with complexity, and are ready to invest time to overcome confusion.	Are impatient with complexity and thus would rather remain confused than make the effort to understand.
Base judgments on evidence rather than personal preferences, Deferring judgment whenever evidence is insufficient. They revise judgments when new evidence reveals error.	Base judgments on first impressions and gut reactions. They are unconcerned about the amount or quality of evidence and cling to earlier views steadfastly.
Are interested in other people's ideas, so are willing to read and listen attentively, even when they tend to disagree with the other person.	Are preoccupied with self and their own opinions, and so are unwilling to pay attention to others' views. At the first Sign of disagreement, they Tend to think, "How can I refute this?"
Recognize that extreme views (whether conservative or liberal) are seldom correct, so they avoid them, practice fairmindedness, and seek a balanced view.	Ignore the need for balance and give preference to views that support their established views.

Practice restraint, controlling their feelings rather than being controlled by them, and thinking before acting.	Tend to follow their feelings and act impulsively.

(Ruggiero, 1995, pp. 18-19)

There is opportunity for communication educators to play a significant role in the development of student skills in critical thinking. If we examine the characteristics of the critical thinker offered us by Ruggiero (1995), it is easy to make quick connection to communication skills. For example, we teach students in communication classes that being fairminded and open-minded is an important characteristic in communication. Helping students to learn how to be open-minded in a tremendous challenge.

There is a verbal communication aspect of critical thinking that is addressed by many scholars. Torrance's definition of critical thinking is "the process of forming ideas or hypotheses, testing hypotheses, and communicating the results" (1962, p. 32), and Tsujimoto writes, "We know that talk is important to learning - as important as reading, writing, and listening - contributing, in fact, to the command of these latter" (1993, p. 34). The articulation of ideas in the classroom can take the form of discussion participation, small group projects (Nugent, 1986; Prutzman, 1978; Staskal, 1980; Hobson, 1990; Tsujimoto, 1993), and offering criticism of oral presentations (Norris 1987). These activities are the crux of what we do in most of our communication skill development courses.

A holistic approach to language arts can, according to education scholars, amplify critical teaching strategies. In fact, incorporating writing, reading, speaking and listening skills across the curriculum is an idea advanced by many leaders in the field. Gough (1991), in her book, *Thinking About Thinking,* encourages teaching of thinking skills in an integrated fashion. It seems to us that there is no one way to help students learn to think critically. As in systems theory, there are multiple ways of reaching the same end (equifinality). The important point is to coordinate the activities to compliment each other -- across the curriculum. This means a coordinated effort between English teachers, geometry teachers, communication teachers, etc. *and* school administrators. Just as educators develop writing-across-the-curriculum and speaking-across-the-curriculum programs, educators and administrators need to develop critical thinking-across-the-curriculum programs. To do less restricts the development of students' abilities to think critically and all the associated and documented benefits of such learning.

In Table 2, there is a list of questions for school administrators to examine as they review the efforts of their faculty (teaching staff) and university (school system) to help students learn to think critically (Harding, 1962). These questions help school administrators to assess their level of support for the integration of critical thinking into the curriculum. Without the support of school administrators, the level of success critical thinking instruction experiences will

be compromised -- in fact, it will be decreased dramatically.

TABLE 2

Ten Questions for Teachers, Instructors, Professors, Heads of Departments, Superintendents, Principals, Headmasters, Academic Administrators, Boards of Education, Boards of Trustees -- and Especially Deans and Presidents of Colleges and Universities

1. Is Creative Thinking or Creative Problem-Solving taught at your institution?
2. If not, are students taught and encouraged to think creatively in their regular courses? What is the evidence?
3. Are you or your teachers encouraged to teach creativity -- that is, by continually introducing and telling new and original concepts and methods?
4. Do you believe that Creative Thinking is below or above Critical Thinking in importance? Why?
5. Do you believe that Originality is vital to Creative Thinking?
6. Do you believe that the Achieving of Less Stereotyped and More Spontaneous Solutions is a way of identifying Creative Thinking?
7. Should students who are clearly able to demonstrate Creativity, Originality, and Inventiveness be specially recognized and rewarded?
8. Should Teachers who are clearly able to demonstrate Creativity, Originality and Inventiveness be recognized by increased rank and salary?
9. To what extent is your Curriculum Planning Committee incorporating Creative Thinking or Creative Problem-Solving in your current course revision?
10. In your own personal growth and development, are your aptitudes, interests, and attitudes oriented more towards Critical Thinking or more towards Creative Thinking? In either case, why?

(Harding, 1962, p. 8)

Ridout (1990) notes that the effective lesson plan includes the integration of listening, reading, writing, and speaking - all of the language arts. The interdependence between the various elements of the curriculum is addressed from a critical thinking

perspective (Hobson, Shuman, 1990; Thaiss, Suhor, 1984; Nugent, 1986; King, 1990, 1992; Tama, 1989; Haynes, 1987;)

Victor Frankl, a man who had learned many of life's hardest lessons while imprisoned in a Nazi labor camp, wrote about the individual's personal and intellectual growth as "the responsibility to find the right answers to life's problems and to fulfill the tasks which it constantly sets for each of us" (1978, p. 35). Piaget emphasizes the idea that life does not guarantee anyone the "right" but rather the "ability" to think - plus many problems that require this ability. Given the abundance of problems faced by students in and out of the classroom requiring creative solutions, the fourth "R" of reasoning (Piro & Iorio, 1990) is a vital element of any school's curriculum. [This would be in addition to the 3 Rs we normally think of in education; Reading, Writing, and Arithmetic.] Reasoning is a central element of much of what we teach in our communication courses -- argumentation, persuasion, audience analysis, etc.

Bibliography

Adler, M. (1985). Why critical thinking programs won't work. In Greenwood Press, (Ed.). *Taking Sides: Critical Issues in Education*. New Haven, CT: Greenwood Press.

Apps, J. W. (1985). *Improving practice in continuing education: Modern approaches for understanding the field and determining priorities*. San Francisco: Jossey-Bass.

Barron, F. (1958). The psychology of imagination. *Scientific American*, 150-166.

Bartlett. Sir F. (1958). *Thinking*. New York: Basic Books.

Boyd, E. M., & Fales, A. W. (1983). Reflective learning: Key to learning from experience. *Journal of Humanistic Psychology, 23*, 99-117.

Brookfield, S. D. (1987). *Developing Critical Thinkers: Challenging Adults to Explore Alternative Ways of Thinking and Acting*. San Francisco, CA: Jossey-Bass Inc., Publishers.

Daloz, L. (1986). *Effective teaching and mentoring: Realizing the transformational power of adult learning experiences*. San Francisco: Jossey-Bass.

Drake, J. (1976). *Teaching critical thinking*. Danville, IL: Interstate Publishers.

Ennis, R. H. (1962). A concept of critical thinking. *Harvard Educational Review, 32*, 81-111.

Ennis, R. H. (1987). A taxonomy of critical thinking dispositions and abilities. In J. B. Baron & R. J. Sternberg (Eds.), *Teaching for thinking* (pp. 9-26). New York: W. H. Freeman.

Ferren, J. (1953). The problem of creative thinking in painting. In *The nature of creative thinking*. New York: Industrial Relations Institute.

Frankl, V. (1978). *The unheard cry for meaning*. New York: Simon and Schuster.

Gough, D. (1991). Thinking about thinking. *Research Roundup, 7*, 1-6.

Habermas, J. (1979). *Communication and the evolution of society*. Boston: Beacon Press.

Halpern, D. F. (1984). *Thought and knowledge: An introduction to critical thinking*. Hillsdale, NJ: Erlbaum.

Harding, H. F. (1962). The need for a more creative trend in American education. In Parnes, S.J., & Harding, H. F. (Eds.). *A Source Book for Creative Thinking*. (pp. 3-8). New York: Charles Scribner's Sons.

Haynes, T. S. (1987, October). *Positive education reform depends on critical thinking*. Paper presented at the annual meeting of the INTERFACE Humanities and Technology Conference, Atlanta, GA.

Heiman, M., & Slomainko, J. (1986). *Critical Thinking Skills*. Washington, D.C.: National Education Association.

Hobson, E., & Shuman, R. B. (1990). *Reading and writing in high schools: A whole-language approach*. Washington, DC: National Education Association.

Hunkins, F. P. (1989). *Teaching Thinking Through Effective Questioning*. Boston, MA: Christopher-Gordon Publishers, Inc.

Kitchener, K. S. (1986). The reflective judgment model: Characteristics, evidence, and measurement. In R. A. Mines & K. S. Kitchener (Eds.), *Adult cognitive development: Methods and models*. New York: Praeger.

King, A. (1992). Facilitating elaborative learning through guided student-generated questioning. *Educational Psychology, 27,* 111-126.

King, P. M., Kitchener, K. S., & Wood, P. K. (1985). The development of intellect and character: A longitudinal-sequential study of intellectual and moral development in young adults. *Moral Education Forum, 10,* 1-13.

McGuinness, C. (1993). Teaching thinking: New sign for theories of cognition. Special issue: Thinking. *Education Psychology, 13,* 305-316.

McPeck, J. E. (1981). *Critical thinking and education*. New York: St. Martin's.

Mead, M., & Metraux, R. (1952). Image of the scientist among high-school students. *Science,* 384-390.

Meyers, C. (1986). *Teaching students to think critically: A guide for faculty in all disciplines*. San Francisco: Jossey-Bass.

Morris, B. Z. (1987, November). *From critical listening to critical analysis: A directed listening approach for the Basic Course*. Paper presented at the annual meeting of the Speech Communication Association, Boston, MA.

Nelson, L. (1989). Critical thinking about critical thinking. *Teaching Forum: The Undergraduate Teaching Improvement Council, 10*, 1-3.

Norris, S. P. (Ed.). (1992). *The Generalizability of Critical Thinking: Multiple Perspectives on an Educational Ideal*. New York: Teachers College, Columbia University.

Nugent, S. M. (1986). Integrating speaking skills into the curriculum. *The Leaflet, 85*, 1-48.

Olson, D. R., & Babu, N. (1992). Critical thinking as critical discourse. In Norris, S. P. (Ed.). *The Generalizability of Critical Thinking: Multiple Perspectives on an Educational Ideal*. (pp. 181-197). New York: Teachers College, Columbia University.

O'Neill, T. (1985). *Censorship - Opposing views*. St. Paul, MN: Greenhaven Press.

Parnes, S. J., & Harding, H. F. (1962). *A Source Book for Creative Thinking*. New York: Charles Scribner's Sons.

Patrick, C. (1955). *What is creative thinking?* New York: Philosophical Library.

Paul, R. W. (1989). Critical thinking in North America: A new theory of knowledge, learning and literacy. *Argumentation, 3*, 197-235,

Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart & Winston.

Piro, J. M., & Iorio, J. E. (1990). Rationale and responsibilities in the teaching of critical thinking to American schoolchildren. *Journal of Instructional Psychology, 17*, 3-10.

Prutzman, P., et al. (1978). *The friendly classroom for a small planet: A handbook on creative approaches to living and problem solving for children*. Wayne, NY: Avery Publishing Group, Inc.

Richmond, B. (1993). Systems thinking: Critical thinking skills for the 1990s and beyond. *System Dynamics Review, 9*, 113-133.

Riding, R. J., & Powell, S. D. (1993). Thinking and education. *Educational Psychology, 13*, 217-227.

Ridout, S. R., et al. (1990). *An integrated language arts teacher education program*. Indiana University Southeast, Department of Education.

Ruggiero, V. R. (1995). *Beyond Feelings: A Guide to Critical Thinking*, 4th Ed. Mountain View: CA: Mayfield Publishing Company.

Russell, D. H. (1956). *Children's thinking*. Boston: Ginn.

Seigel, H. (1988). *Educating reason: Rationality, critical thinking and education*. New York: Routledge.

Sinclair, A. (1994). Prediction making as an instructional strategy: Implication of teacher effects on learning, attitude toward science, and classroom participation. *Journal of Research and Development in Education, 27,* 153-161.

Smith, B. O. (1953). The improvement of critical thinking. *Progressive Education, 30,* 129-134.

Staskal, D. (1980). *Language arts project: Radio program production.* Cedar Falls, IA: Area Education Agency 7.

Stice, J. (Ed.). (1987). *Developing critical thinking and problem-solving abilities.* San Francisco: Jossey-Bass.

Tama, M. C. (1989). Critical thinking: Promoting it in the classroom. *Eric Digest.*

Thaiss, C. J., & Suhor, C. (Eds.). (1984). *Speaking and writing, K-12: Classroom strategies and the new research.* Urbana, IL: National Council of Teacher of English.

Torrance, E. P. (1962). Developing creative thinking through school experiences. In S. Parnes & H. Harding (Eds.), *A Source Book for Creative Thinking.* (pp. 31-47). New York: Charles Scribner's Sons.

Torrance, E. P., et al. (1958). *Explorations in creative thinking in mental hygiene: II. Some characteristics of the more creative individuals.* Minneapolis: Bureau of Educational Research, University of Minnesota.

Tripp, E. L. (1990). Speak, listen, analyze, respond: Problem-solving conference. *Teachers of English in Two-Year Colleges,* 183-186.

Tsujimoto, J. I. (1993). Talk for the mind. *English Journal*, 34-37.

Warnick, B., & Inch, E. S. (1989). *Critical Thinking and Communication: The Use of Reason in Argument*. New York: Macmillan Publishing Company.

Young, R. E. (Ed.), (1980). *Fostering critical thinking*. San Francisco: Jossey-Bass.

APPENDIX A

Sample Exercises for Integrating Critical Thinking into Communication Instruction

We are including exercises representative of the kinds of activities found in *Instructor's Manuals* created to support some of the leading textbooks for beginning instruction in communication. These activities can be used as is in your classes or modified to be more appropriate in your classes. [These are not all the activities available nor are they all inclusive of the *Instructor's Manuals* for the beginning communication course.] It would probably be helpful for you to locate additional examples and opportunities for your classes.

In addition, we recommend the following sources for you to search for exercises and class activities that might help you teach critical thinking and develop critical thinking skills in your communication classes.

1. *The Speech Communication Teacher*, published quarterly by the Speech Communication Association, 5105 Backlick Avenue, Annandale, Virginia.

2. Phelan, P. (Ed.). (1989). *Classroom Practices in Teaching English,* Volume 24. (Urbana, IL: National Council of Teachers of English).

3. Harnadek, A. (1976). *Critical Thinking: Book 1.* (Pacific Grove, CA: Midwest Publishing Company, Inc.).

4. Harnadek, A. (1980). *Critical Thinking: Book 2.* (Pacific Grove, CA: Midwest Publishing Company, Inc.).

5. Ruggiero, V.R. (1995). *Beyond Feelings: A Guide to Critical Thinking,* 4th Ed. (Mountain View, CA: Mayfield Publishing Company).

6. Moore, B.N., & Parker, R. (1992). *Critical Thinking,* 3rd Edition. (Mountain View, CA: Mayfield Publishing Company).

Exercise #1

Advertisers are usually very conscious of their audience. Choose an issue of a popular magazine such as *Time, Newsweek, Sports Illustrated, Cosmopolitan,* or the like. From that issue select five advertisements to analyze. Try to determine the audience being appealed to in each advertisement, and analyze the appeals (verbal and visual) used to persuade buyers. How might the appeals differ if the ads were designed to persuade a different audience?

Source: Lucas, S. (1992). Instructor's Manual to Accompany The Art of Public Speaking, Fourth Edition. (New York: McGraw-Hill, Inc.). p. 81.

"Finding the occasional straw of truth awash in a great ocean of confusion and bamboozle requires intelligence, vigilance, dedication, and courage."
- *Carl Sagan*

Exercise #2: Ethics of Communication: "The Classroom Persuader"

Jim Thomas was a junior in Business and Public Administration when he took a class in public speaking. In the class he was expected to give two speeches, each with short-term goals instrumental in gaining audience acceptance for an ultimate goal. He was not required to hand in a bibliography or a manuscript with footnotes. He was supposed to write a document explaining how he chose the arguments that he did and why the audience would be predisposed to accept those arguments. He learned in the course that effectiveness is the main goal of the persuader, that audiences are not particularly sensitive to the formal validity of arguments, and that credibility is in the eyes of the receiver. The teacher judged the speech on the basis of whether or not he himself was inclined to accept the proposition and on the basis of anonymous criticisms which were handed in to the teacher.

Jim decided that the ultimate goal of his persuasive campaign would be audience acceptance of an anti-abortion proposition. To enhance his credibility, Jim sprinkled his speech with quotations from various Roman Catholic, Protestant, and Jewish theologians -- all of which he found published book that took a stand against abortions. He also looked up eight foreign phrases in the back of a *Webster's Pocket Dictionary*; the class looked quite impressed when he used terms like *vis-a-vis, deriguer, Weltschmertz* and *Zeitgeist*. Even the teacher complimented him on his tremendous vocabulary and his command of the language.

Jim couldn't think of very many arguments against abortion, but he found an article in *Reader's Digest* that provided the six main arguments he used in his two speeches. These six arguments he filled out with anecdotes about abortion which he picked up around the dormitory. One was an agonizing story about a girl from the university who was one month pregnant by a sophomore music major who had no visible means of support. He embellished the story somewhat by filling in many interesting details about the girl's family and their probable response to her condition. The girl got a legal abortion in another state and then went into a condition of severe depression over the loss of her child. At last report she was out of school and unable to work because she always broke into tears on the job. The story shook the whole class, and the teacher as well. Jim also found some pictures of a fetus in a wastebasket which he brought to his second presentation. He hung the picture on the board as he gave his second speech and finished the speech with an estimate of how many potential scholars, teachers, and geniuses would end up in the wastebasket of a liberalized abortion law were passed in his home state.

The class's response was impressive. Only three students out of twenty had found an anti-abortion stand acceptable in the pre-test which Jim had given before his first speech. Immediately after his last speech nine students responded

favorably to the anti-abortion position on his questionnaire. The teacher was quite impressed. He received a high grade on his persuasive speech.

* * * * * * * * * *

Your group has twenty-five minutes to decide what criteria (standards) your group would use to judge the persuasion employed by Jim Thomas. What specific choices do you find unethical? Why? What specific choices do you fine ethical? Why? Can your group write out the criteria used by your group to determine the ethical quality of Jim's behavior? Can those criteria be generalized to other situations?

Choose someone from your group to present the views of your group to the class.

Source: Beebe, S.A., & Beebe, S.J. (1991). Instructor's Resource Manual: Public Speaking, An Audience-Centered Approach. (Englewood Cliffs, NJ: Prentice-Hall). pp. 143-144.

Exercise #3: Tag Team Debate

A. Purpose: To provide experience in forming arguments and responding to attack.

B. Procedure: Choose a controversial topic with which students are familiar. Divide the class into two groups. You may ask them to sit on opposite sides of the room for a more dramatic impact. Beginning with one student ask for an impromptu argument on the topic. After delivering the argument, the student should "tag" a respondent from the opposite team to refute and advance another argument. The altering of sides continues until everyone has had a change to speak.

Source: German, K. (1994). Instructor's Manual To Accompany Principles and Types of Speech Communication, 12th Edition. (New York: HarperCollins College Publishers). p. 204.

"All knowledge has its origins in our perceptions."
- Leonardo Da Vinci

Exercise #4: Description Exercise

Objectives: To practice creating mental images with language.

Audience identification.

The difference between a memorable speech and one that is quickly forgotten or given divided attention during the presentation can be related to the speaker's ability to engage the listener. The process of making the connection with the audience is multifaceted. Not only must the speaker assess the needs and culture of the audience, but that speaker must also create a dialogic rather than monologic environment. Dialogues require audience participation; the speaker who is dialogic does not view the audience as a blank slate but rather as an active, dynamic, vital entity wanting to experience rather than hear the message. The use of both verbal and nonverbal imagery allows the listener to participate in the speech with both right brain and left brain activity. Imagery requires that the listener move beyond one sense, the ear, to construct with the mind something the brain, "sees." The active mental effort needed to create a picture makes verbal imagery an important component in engaging the audience.

The purpose of this exercise is to encourage the use of imagery in speeches and to give students practice in the exercise of creating an image. Ask students to recall an important trip, event, or scene in their life. This can be a family vacation to the beach, a school trip to an athletic event, a situation that had meaningful impact on their life. They are to speak for three minutes about their recollection. The speech should strive to re-create the meaning derived by the speaker while he or she was experiencing the scene. Language that accesses the five senses and analogies are particularly appropriate. After each speaker, ask the class to describe the picture created for them by the speaker using different words.

This exercise is particularly effective in uniting the class and creating a positive climate. A good example occurred one year when a white student chose to describe going to see the movie titled *Mississippi Burning* with an African-American student. She described how she initially thought the movie would recount some of what she had read in American history. She described her emotions, the goose bumps that rose on her skin, and the sick feeling she had in her stomach as the movie unfolded. She also described the sweet, low humming of the gospel music in the movie

by her friend. The image of the two friends of different cultures and the special understanding that took place that night at the movie was very powerful for the class. The audience relived the event and the moment she came to the understanding: "so *this* is prejudice."

Source: Makay, L. (1995). Instructor's Manual/ Test Bank to Accompany Public Speaking: Theory Into Practice, Second Edition. (Fort Worth, TX: Harcourt Brace College Publishers). pp. 211-212.

"Doubt grows with knowledge."
- *Goethe*

Exercise #5: A "Lifeboat Activity" About Cultural Prejudice

Objective: To evaluate individual and group decision-making criteria and biases.

Instructions for instructors: This activity is based on the principles of the old lifeboat exercise, changed to include a more culturally diverse group. The teacher needs to be prepared to go beyond group discussion and problem-solving issues to discuss issues of prejudice. Have the students answer individually, then work for consensus in a group.

Instructions for students: Imaging you ar at a friend's graduation party. Because of a storm, most of the guests leave early. Suddenly you hear local sirens go of warning you of an approaching tornado. Your friend tells you: "There's no basement, but I have a small underground cellar that will hold four people. Go get three people to go down there with you so you'll be safe. The rest of us will take our chances upstairs. Maybe we'll be lucky and the tornado will miss us." Whom will you choose to go down in the cellar with you?

Patrick: Patrick is a tall, attractive, blond 30-year-old man of Irish descent. He organized the city's Walk for Life to raise funds for people living with AIDS. In fact, he is credited with raising over $1 million and has been honored by numerous religious and service agencies. This personable, kind gay man has lived with HIV for several years.

Anna: Anna is 98 years old. She is a European-American woman who grew up in rural Arkansas as part of a huge family. Sometimes she seems narrow-minded and stubborn, but she has amazing perceptions. She has seen many things during her long life, and you appreciate her insights into the world. She has stopped you from making a mistake more than once, and you are quite fond of her.

Francisco: Francisco is a Mexican government official visiting this country. He is talented and powerful. He is friendly, outgoing, somewhat of a wheeler-dealer, but one with a good heart and admirable motives. A good friend of your father's, this 40-year-old man seems to be able to get along with everyone. You admire his intellect, his ability to bridge the gap between the United States and Mexico, his talent to make things happen, and his friendliness. He contributes much to his country.

Tracy: Tracy is 19 years old and of African descent. She has a daughter who is three and a newborn son. She lives with her parents and has recently returned to school to become a beautician. Right now she's on maternity leave from school.

Chenu: Chenu is a resident alien who was born in India. He is in his twenties an recently completed a doctorate in pharmaceutics. He is kind, brilliant, and promising and has a job lined up as a researcher for a pharmaceutical company in New Jersey.

Nina: Nina, in her forties, is a Russian Jew who fled the former Soviet Union about 10 years ago with her husband and daughter. She has struggled, but now is on the faculty at a local college. Her daughter is attending a university in California. Her husband plays the violin with a major city symphony. She loves the United States.

Charlie: Charlie just turned 13. He's a city kid who has moved to the suburbs. He's African-American and is friendly, smart, gentle, and courteous. He came to the party with his sister, Tracy.

Jack: Jack is 21 and a college student. He comes from an upper-class family of European descent. He always seems to be in trouble. His family isn't sure whether the problem is drugs, or alcohol, or mental illness. He flunks many of his courses and frequently has brushes with the law. He feels like an outcast.

Write the names of the three guests you will save here:

* * * * * * * * * *

Discuss the activity with the others in your group. Here are some questions to consider:

1. What criteria did you use for deciding which guests to take into the cellar?
2. How did your criteria compare to those of others in your discussion group?
3. What basic principles of problem solving could be applied to this situation?
4. What are the problems with stereotyping? To what extent do you think the preceding descriptions reinforce stereotypes?
5. Discuss the concepts of stereotyping, prejudice, political correctness, mixing of cultures, and co-cultures.
6. When doing a similar exercise in one basic communication class, one student said, "This is ridiculous. No one ever has to make these kind of life-or-death decisions. It's a stupid exercise." Another student became serious and impatient. "I do," he said, "I'm a paramedic, and sometimes

I come to a situation where I know I can't save everyone, and I have to decide what to do first. Just last week I went to an accident where a mother and her baby were both in critical condition. Life would be nothing for the baby if the mother died. The mother might have other children. The mother might not be able to survive knowing she was driving the car when her baby was killed. I had to decide which person I would help first." What has this activity revealed about your value system?

7. Try to reach consensus about which three people to save.

Source: Aitken, J.E. (1995). Instructor's Manual to Accompany Competent Communication. (New York: St, Martin's Press). pp.152-153.

"Judge a man by his questions rather than his answers."
- *Voltaire*

Exercise #6: Motivational Strategies

Objective: Provide students with practice identifying and using motivational strategies.

Format: Small Group

Here are three tasks related to motivational strategies for groups of three or five students working together. After the tasks have been completed, the results and product can be presented to the whole group.

1. Provide groups with a number of magazine ads. Each group is to discuss and identify the appeals to basic needs from each magazine ad. Specifically they should decide which level(s) of Maslow's hierarchy are used. The group members are to plan to orally share their observations about the motivational strategies from one as with the class.

2. Group members are to make a [*sic*] list of what they believe are the three motivational appeals used most frequently in television ads.

3. Each group plans a short speech together designed to sell one real item they have with them in the classroom. They must use at least two of the following motivational strategies: (1) Cost-Reward, (2) Cognitive Dissonance, (3) Expectancy Value, (4) Basic Needs.

Source: Goulden, N.R., & Verderber, R.F. (1994). Instructor's Manual for Verderber's The Challenge of Effective Speaking, Ninth Edition. (Belmont, CA: Wadsworth Publishing Company). p. 110.

"He who proves things by experience increases his knowledge; he who believes blindly increases his errors."
- Chinese Proverb

Exercise #7: Where's The Common Ground

The class it to choose a controversial question, one on which class members are likely to have definite and varying opinions, for example: "A two-year trial marriage should be a couple's legal option" or "Parents should not limit the behavior of their children except when physical harm or property damage is likely to result."

Then, members of the class are to pair off and hear each other's candid opinion on the chosen issue. During the exchange, each person is to note mentally the evident degree of identification on this issue -- or divergence -- between himself or herself and the other person.

After three to five minutes, the pairs are to break up and new ones formed. Now these new pairs exchange views on the same issue, with no references to the prior exchange. Continue the activity until each person has had five experiences n giving opinions and listening to the opinions of others. What conclusions about your identity can you draw from the experiences? What observations have you about identification -- the problem of discovering common ground -- in communication? How far are you willing to go in identifying with people and their ideas? Or what grounds might others find a basis for communicating with you in discussing the issues?

The instructor may ask you to present your analysis in a paper, report, or discussion.

Source: Barrett, H. (1993). Instructor's Manual to Accompany Speaking in America. (Fort Worth, TX: Harcourt Brace College Publishers). p. 46.

"Things are not always what they seem."
- Phaedrus

Exercise #8

Popular nonfiction writing often provides helpful models of informative discourse on technical topics. Have each student select an article of interest from the medicine, science, or business section of *Time* or *Newsweek*. The student should prepare a brief report on the article answering each of the following:

1. How effectively does the author use definition, explanation, description, comparison, contrast, and examples to make the subject clear and interesting to ordinary readers? Identify two particular techniques used in the article that you might want to try in your next informative speech.

2. Are there some points in the story that you don't fully understand? If so, what information might the author have supplied to make the points clear to you?

3. Assume you will be giving a speech on the same topic as the article. What *specific* steps would you take to relate the topic directly to your classmates? To make it fully understandable to them? Consider not only what you might say in your speech, but also how you might use visual aids to enhance what you say.

Discussion:

This can be a very helpful exercise if you have students give more than one informative speech or if you are teaching an advanced public speaking class. Because of its complexity, it does not work well when beginning speakers are preparing their first informative speeches.

Source: Lucas, S.E. (1992). Instructor's Manual To Accompany The Art of Public Speaking, Fourth Edition. (New York: McGraw-Hill, Inc.). pp. 245-246.

Exercise #9

Require students to find a published argument, such as a letter to the editor, and advertisement, an editorial, or a political ad. They should identify the claim being made and the grounds on which the claim is based. Is the warrant explicitly stated? If not, students should determine the implied warrant. What backing, if any, is offered for the warrant? Is the argument adequately qualified? Are there possible rebuttals to the argument? This can be done as an assignment to be turned in, with students simply marking the parts of the argument in felt pen. Or have students being the arguments to class and present them to their classmates orally.

Source: Brydon, S.R., & Scott, M.D. (1994). Instructor's Manual to Accompany Between One and Many: The Art and Science of Public Speaking. (Mountain View, CA: Mayfield Publishing Company). p. 114.

Exercise #10: The Expository Value of a Story on Science

Objectives: To have students practice an informative message.

To practice capturing and sustaining audience interest while presenting a clear message.

Have each student review editions of *The New York Times*, the magazine *Discover*, or a similar publication. The students, for this activity, must select a new discovery, scientific finding, theory, or experimental procedure and prepare a four- to five-minute speech about the choice they have made. The speech must follow the guidelines for informative speaking and underscore the value of the story on science that was selected for the activity. Questions students may use in developing their speech include:

1. Was the story confusing or unclear at any point?
2. What could have been done -- added or deleted -- to make the topic and purpose clearer?
3. What, if any, definitions were used by the writer or writers? Were they definitions of example, negation, or operation?
4. Was there any particular description or statement of explanation that you especially liked or disliked in the article? Why?
5. How can we see the value of science in the story chosen?

Source: Makay, L. (1995). Instructor's Manual\ Test Bank to Accompany Public Speaking: Theory into Practice, Second Edition. (Fort Worth, TX: Harcourt Brace College Publishers). p. 227.

Exercises #11 to #14

#11. Ask students to keep an individual speech file for present and future use. The file should be prepared so that it will serve as a nucleus for expanded information on core topics as well as additional topics. Library research skills can be incorporated as students add notes on relevant reading. Organization, argumentation, audience analysis, and language skills can also be utilized if students are asked to jot notes in their files about potential ways to develop and adapt their speech material. This file might replace individual assignment sheets for classroom speeches or the daily speech journal.

#12. To foster in-depth treatment of a single topic during a term students could be asked, either as a group or individually, to identify a topic around which all of their speaking assignments would revolve. The critical issues approach is developed more fully in . . . "Speaking on Critical Issue Topics in the Public Speaking Course," *The Speech Communication Teacher, 2* (1987): pp. 12-13.

#13. Students can prepare an oral or written critical analysis assignment in which they review and analyze an event such as an outside speaker, a national public address, or a published speech text. Audience members or readers should be provided with arguments and supporting material in an attempt to persuade them to accept the speaker's final evaluation.

#14. Small peer groups of three or four students can be formed to provide feedback following speeches. Their discussion should focus on the speeches of each group member, reinforcing positive progress and offering constructive suggestions for coping with each speaker's limitations. To obtain maximum results, it is important that the task dimension of these groups and to concentrate on the development of each group member. For this reason, the group should be supervised and meet regularly.

Source: German, K. (1994). Instructor's Manual To Accompany Principles and Types of Speech Communication, Twelfth Edition. (New York: HarperCollins College Publishers). p. 28.

APPENDIX B

Additional Resources

Listed below are readings that illustrate the significant attention given critical thinking in teaching. There are examples of interest in critical thinking from many disciplines, including communication. In addition, we have included readings which establish a philosophical foundation for issues surrounding critical thinking. We hope you take the time to find articles you think appropriate to your interests and teaching goals.

Additional Readings in Critical Thinking

Adams, S.M., & Hamm, M. (1987). Teaching students critical viewing skills. *Curriculum Review, 26,* pp. 29-31.

Akbari, Z.M., & Gray, M.W. (1990). Computer assisted instruction and critical thinking. *Journal of Computers in Mathematics and Science Teaching, 9,* pp. 71-78.

Atwater, T. (1991). Critical thinking in basic U.S. government classes. *Political Science and Politics, 24,* pp. 209-211.

Ayers, S.J. (1990). Solving problems with creative problem solving. *Southern Social Studies Quarterly, 15,* pp. 12-19.

Bacig, T.D., *et al.* (1991). Computer-assisted instruction in critical thinking and writing: A process/model approach. *Research in the Teaching of English, 25,* pp. 365-382.

Baron, J. (1990). Thinking about consequences. *Journal of Moral Education, 19,* pp. 77-87.

Baron, J. (1981). Reflective thinking as a goal of education. *Intelligence, 5,* pp. 291-309.

Barton, J.M. (1990). The teacher as critical thinker. *Momentum, 21,* pp. 20-22.

Beyer, B.K. (1985). Critical thinking: What is it? *Social Education, 49,* pp. 270-276.

Beyer, B.K. (1983). Common sense about teaching thinking skills. *Educational Leadership, 41,* pp. 44-49.

Brandhorst, A.R. (1989). Critical thinking: Schemata vs. skills. *Theory and Research in Social Education, 17,* pp. 196-209.

Capps, K., & Vocker, D.E. (1991). Developing higher-level thinking skills through American history writing assignments. *OAH Magazine of History, 6,* pp. 6-9.

Carr, K.S. (1988). How can we teach critical thinking? *Childhood Education, 65,* pp. 69-73.

Chaffee, J. (1992). Teaching critical thinking across the curriculum. *New Directions for Community Colleges, 20,* pp. 25-35.

Ciofi, G. (1992). Perspective and experience: Developing critical reading abilities. *Journal of Reading, 36,* pp. 48-52.

Commeyras, M. (1989). Using literature to teach critical thinking. *Journal of Reading, 32,* pp. 703-707.

Court, D. (1991). Teaching critical thinking: What do we know? *Social Studies, 82,* pp. 115-119.

Crinshlow, W., *et al.* (1990). Multicultural ways of knowing: Implications for practice. *Journal of Education, 172,* pp. 101-117.

Daiute, C. (1989). Play as thought: Thinking strategies of young writers. *Harvard Educational Review, 59,* pp. 1-23.

Elbow, P. (1983). Teaching thinking by teaching writing. *Change, 15,* pp. 37-40.

Ennis, R.H. (1990). The extent to which critical thinking is subject-specific: Further classification. *Educational Researcher, 19,* pp. 13-16.

Etchison, C. (1991). Creating critical thinkers, not parrots: One teacher's hope. *Proteus, 8,* pp. 24-26.

Evans, E.B., & Sunnick, R. (1989). Evaluating evidence of critical thi king skills. *Business Education Forum, 43,* pp. 16-18.

Ford, C. (1985). How to create a critical thinking center. *Clearing: Nature and Learning in the Pacific Northwest, 39,* pp. 9-11.

Frisby, C.L. (1991). Thinking skills instruction: What do we really want? *Educational Forum, 56,* pp. 21-35.

Gallagher, J.C. (1991). Integrating critical thinking and library skills into the English curriculum: Developing the model. *School Library Media Activities Monthly, 8,* pp. 23-25, 51.

Gauthier, L.R. (1992). Using character charts for critical thinking in the classroom. *Reading Teacher, 45,* pp. 654-655.

Girvan, J.T. (1989). Enhancing student decision making through use of critical thinking/questioning techniques. *Health Education, 54,* pp. 87-88, 99.

Green, C.S., III, & Klug, H.G. (1990). Teaching critical thinking and writing through debates: An experimental evaluation. *Teaching Sociology, 18,* pp. 462-471.

Green, J.W., & Roseboro, B.A. (1989). Critical thinking: A lifelong process. *Michigan Social Studies Journal, 3,* pp. 19-20.

Haggard, M.R. (1988). Developing critical thinking with the directed reading-thinking activity. *Reading Teacher, 41,* pp. 526-533.

Hammond, Z.L. (1990). Recipe for making your home "thought-full." *PTA Today, 16,* pp. 14-15.

Hawkins, K. (1992). Why ask why? Developing critical thinking skills in tomorrow's leaders. *Campus Activities Programming, 25,* pp. 38-42.

Hernstein, R. J., *et al.* (1986). Teaching thinking skills. *American Psychologist, 41,* pp. 1279-1289.

Heyman, G.A., & Daly, E.R. (1992). Teaching critical thinking in vocational-technical and occupational classes. *New Directions for Community Colleges, 20,* pp. 103-108.

Hoffman, J.V. (1992). Critical reading/thinking across the curriculum: Using I-charts to support learning. *Language Arts, 2,* pp. 121-127.

Hunter, E. (1991). Focus on critical thinking skills across the curriculum. *NASSP Bulletin, 75,* pp. 72-76.

Johnson, D.W. & Johnson, R.T. (1988). Critical thinking through structured controversy. *Educational Leadership, 45,* pp. 58-64.

Kamii, C. 91991). Toward autonomy: The importance of critical thinking and choice making. *School Psychology Review, 20,* pp. 382-388.

Kaplan, L.D. (1991). Teaching intellectual autonomy: The failure of the critical thinking movement. *Educational Theory, 41,* pp. 361-370.

Karmos, J.S., *et al.* (1990), Questioning techniques for the classroom. *Illinois Schools Journal, 69,* 20-24.

Kay, L.H., & Young, J.L. (1986). Socratic teaching in social studies. *Social Studies, 77,* pp. 158-161.

King, P.M. (1992). How do we know? Why do we believe? Learning to make reflective judgmnents. *Liberal Education, 78,* pp. 2-9.

Knight, C.L. (1992). Teaching critical thinking in the social studies. *New Directions for Community Colleges, 20,* pp. 63-73.

Kober, N. (1991). What critical thinking approach is the best? *School Administrator, 48,* pp. 14-17.

Laughlin, J.S. (1992). When students confront the experts: toward critical thinking. *English Journal, 81,* pp. 72-75.

Lazare, D. (1992). Teaching the political conflicts: A rhetorical schema. *College Composition and Communication, 43,* pp. 194-213.

Mairoana, V.P. (1991). The road from rote to critical thinking. *Community Review, 11,* pp. 53-63.

Makau, J.M. (1985). Adapting the judicial model of reasoning to the basic argumentation and debate course. *Communication Education, 34,* pp. 227-234.

Marker, P.M. (1990). Creating an environment that sustains critical thinking. *Social Studies Review, 29,* pp. 58-60.

Masters, T.D. (1991). The critical thinking workbook. *Instructor, 100,* pp. 64-68.

McBride, R.E. (1992). Critical thinking -- An overview with implications for physical education. *Journal of Teaching in Physical Education, 11,* 112-125.

McTighe, J., & Lyman, F.T., Jr. (1988). Cueing thinking in the classroom: The promise of theory-embedded tools. *Educational Leadership, 45,* pp. 18-24.

Miller, C. (1990). Higher-order thinking: An integrated approach for your classroom. *Vocational Education Journal, 65,* pp. 26-27, 69.

Moebius, M. (1991). What do you believe? Persuasive speeches in eighth grade. *English Journal, 80,* pp. 38-42.

Morgan, M. (1990). Encouraging critical thinking in the language arts. *Language arts, 67,* pp. 780-782.

Morris, B.S. (1989). The television generation: Couch potatoes or informed critics? *English Journal, 78,* pp. 35-41.

Muldoon, P.A. (1990). Challenging students to think: Shaping questions, building community. *English Journal, 79,* pp. 34-40.

Mumford, R.L. (1991). Teaching history through analytical and reflective thinking skills. *Social Studies, 82,* pp. 191-194.

Nauman, J.A., Jr. (1991). Letter writing: Creative vehicle to higher-level thinking. *Social Education, 55,* p. 198.

Norris, C., *et al.* The effect of computer science instruction on critical thinking skills and mental alertness. *Journal of Research on Computing in Education, 24,* pp. 329-337.

Norris, S. (1990). Can we test validity for critical thinking? *Educational Researcher, 18,* pp. 21-26.

Nugent, S.M. (1990). Five prerequisites for teaching critical thinking. *Research & Teaching in Developmental Education, 6,* pp. 85-96.

Parker, W.C., *et al.* (1991). Helping students think about public issues: Instruction versus prompting. *Social Education, 55,* pp. 41-44.

Paul, R.W., & Adamson, K.R. (1990). Using critical thinking to identify bias in the news media: The Art of critical analysis. *Social Studies Review, 29,* pp. 11-28.

Paul, R.W. (1985). The critical-thinking movement. *Phi Kappa Phi Journal, 65,* pp. 2-3, 32.

Pellow, R.A. (1992). Using thinking skills to solve geographic riddles. *Social Studies Journal, 19,* pp. 9-12.

Pogonowski, L. (1987). Developing skills in critical thinking and problem solving. *Music Educators Journal, 73,* pp. 37-41.

Potter, P., *et al.* A practical approach to critical thinking. *Principal, 71,* pp. 40-41, 43.

Rankin,, V. (1988). One route to critical thinking. *School Library Journal, 34,* pp. 28-31.

Reboy, L.M., & Semb, G.B. (1991). PSI and critical thinking: Compatibility or irreconcilable differences? *Teaching of Psychology, 18,* pp. 212-215.

Ristow, R.S. (1988). The teaching of thinking skills: Does it improve creativity? *Gifted Child Today, 11,* pp. 44-46.

Rooze, G.E. (1989). Developing thinking using databases: What's really involved? *Social Studies Texan, 5,* pp. 26-28.

Rowen, A. (1990). Developing critical thinking skills with the newspaper. *Georgia Social Science Journal, 21,* pp. 22-23.

Rowland, D.J. (1989). Making time for critical thinking skills. *Instructor, 99,* pp. 36-37.

Scales, P. (1987). All children need to think critically. *PTA Today, 12,* pp. 8-10.

Schamel, D., & Ayers, M.P. (1992). The minds-on approach: Student creativity and personal involvement in the undergraduate science laboratory. *Journal of College Science Teaching, 21,* pp. 226-229.

Seabury, M.B. (1991). Critical thinking via the abstraction ladder. *English Journal, 80,* pp. 48-51.

Seif, E. (1981). Thinking and education: A futures approach. *Journal of Thought, 16,* pp. 73-87.

Sensenbaugh, R. (1991). Developing strategies for reading, writing, and critical thinking: The intermediate grades. *Reading Research and Instruction, 31,* pp. 77-80.

Shapiro, J., & Kilbey, D. (1990). Closing the gap between theory and practice: Teacher beliefs, instructional decisions, and critical thinking. *Reading Horizons, 31,* pp. 59-73.

Shayer, M., & Adey, P.S. (1992). Accelerating the development of formal thinking in middle and high school students II: Postproject effects on science achievement. *Journal of Research in Science Teaching, 29,* pp. 81-92.

Shepelak, N.J., *et al.* (1992). Critical thinking in introductory sociology classes: A program of implementation and evaluation. *Teaching Sociology, 20,* pp. 18-27.

Smith, C.B. (1990). Two approaches to critical thinking. *Reading Teacher, 44,* pp. 350-351.

Smith, C.B. (1990). Are reasoning and problem solving holistic events? *Reading Teacher, 44,* pp. 270-271.

Smith, M., & Salome, P. (1989). Poetry as a springboard to critical thinking. *Exercise Exchange, 35,* pp. 36-38.

Sokoloff, H. (1984). Integrating thinking skills into the content areas. *Media and Methods, 21,* pp. 25, 44.

Sproule, J.M. (1987). Ideology and critical thinking: The historical connection. *Journal of the American Forensic Association, 24,* pp. 4-15.

Sternberg, R.J. (1987). Teaching critical thinking: Eight easy ways to fail before you begin. *Phi Delta Kappan, 68,* pp. 456-459.

Sternberg, R.J. (1985a). Teaching critical thinking, Part 1: Are we making critical mistakes? *Phi Delta Kappan, 67,* pp. 194-198.

Sternberg, R.J. (1985b). Teaching critical thinking, Part 2: Possible solutions. *Phi Delta Kappan, 67,* 277-280.

Stice, J.E. (1987). Learning how to think: Being earnest is important, but its not enough. *New Directions for Teaching and Learning, 30,* pp. 93-99.

Stone, N.R. (1990). Developing critical thinkers: Content and process. Ideas in practice. *Journal of Developmental Education, 13,* pp. 20-22.

Stotsky, S. (1991). On developing independent critical thinking: What we can learn from studies of the research process. *Written Communication, 8,* pp. 193-212.

Strange, C. (1992). Beyond the classroom: Encouraging reflective thinking. *Liberal Education, 78,* pp. 28-32.

Sublett, M.D. (1991). Incorporating student logbooks into geography classes. *Journal of Geography, 90,* pp. 50-53.

Tama, M.C. (1989). Critical thinking has a place in every classroom. *Journal of Reading, 33,* pp. 64-65.

Tierney, R.J., *et al*. (1989). The effects of reading and writing upon thinking critically. *Reading Research Quarterly, 24,* pp. 134-173.

Tyser, R.W., & Cerbin, W.J. (1991). Critical thinking exercises for introductory biology courses. *BioScience, 41,* pp. 41-46.

VanSickle, R.L., & Hoge, J.D. (1991). Higher cognitive thinking skills in social studies: Concepts and critiques. *Theory and Research in Social Education, 19,* pp. 152-172.

Walsh, D. (1988). Critical thinking to reduce prejudice. *Social Education, 52,* pp. 280-282.

Walters, K.S. (1990). Critical thinking: Rationality, and the vulcanization of students. *Journal of Higher Education, 61,* pp. 448-467.

Williams, C.H. (1991). Doing critical thinking together: Applications to government, politics, and public policy. *Political Science and Politics, 24,* pp. 510-516.

APPENDIX C

Hints on Using or Modifying Exercises for Critical Thinking

We urge you to try our experiment: try our methods, modify them as you see fit, test out those that seem to work for your students, *share your ideas with your colleagues* [emphasis added]. While doing this, keep in mind the following general guidelines:

1. Make your critical thinking skills exercises *relevant* to your students. If they are working toward solving problems that interest them, they will be more involved in the learning process.

2. In both critical thinking exercises and the structure of your classroom, find ways to make learning an *active* process for your students.

3. Help students use problem-solving methods that prevent them from *skipping steps* -- ask them to work in pairs, talking aloud their thinking, or to draw models of their problems.

4. When introducing a new set of concepts, always show students both the *big picture* (so that they can see the relationship between disparate facts) and ways to break down a complex idea into its *component parts*.

5. Focus on the problem-solving *process*, not the memorization of facts.

6. Find ways to individually *reinforce* your students for their approximation to appropriate performance.

(Heiman & Slomianko, 1986, p. 19)